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## An Exploration of Online Students' Impressions of Contextualization, Segmentation, and Incorporation of Light Board Lectures in Multimedia Instructional Content

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## INTRODUCTION

The increasing expansion and demand for distance learning course offerings has forced faculty to examine how to transform their traditional lecture content into multimedia content. (Mandernach, 2009). Research indicates that content-specific and pedagogically-intentional online multimedia is a valuable resource that can facilitate student learning based on a number of factors, one being the positive level of student satisfaction it generates. The present qualitative and quantitative empirical study analyzes strategies that can be employed in the development of multimedia that will improve the level of satisfaction the online students experience in navigating their way through a class.

Multimedia learning is defined as the use of text, graphics, animation, pictures, video, and sound to present instructional content (Najjar, 1996). It is the presentation of words and pictures that are intended to foster learning (Mayor & Moreno, 2003). Research indicates that well-designed multimedia that includes words with associated images aids students in developing a deeper understanding of the materials than traditional communication modes that only involve words. (Mayer, 2003). The brain's information processing system consists of dual channels (Mayor & Moreno, 2003). The auditory/verbal channel processes verbal input and the visual/pictorial channel processes visual input. Meaningful learning occurs when the learner synchronously processes instructional content on both the verbal and visual channels. Under these circumstances, the brain makes visual connections between images and concepts which significantly increases comprehension of new concepts (Vazquez & Chiang, 2016).

The value of multimedia is even more pronounced in the online classroom, as the physically isolated learning environment lacks the entertainment and social aspects found in the traditional classroom (Mandernach, 2009). Due to the nature of the virtual classroom, instructor-created content may have a greater impact on the distance education students than on the traditional students. For example, the inclusion of instructor-created multimedia, versus commercially-prepared content, provides online students with the benefit of listening to the instructor's discussion of the concepts, similar to the students in the traditional face-to-face courses. Researchers examined the value of instructor-created multimedia in a study and the qualitative findings revealed that the students felt it was an important component to their online learning experience (Mandernach, 2009).

Due to the increased access and decreased cost of the tools necessary to develop multimedia materials and the increased awareness of its pedagogical value, the use of these resources for instructional purposes has increased significantly. However, the value of the multimedia is contingent upon its appropriate use, selection and placement (Mayer & Anderson, 1992). Various factors can increase or decrease its impact on the student learning experience.

Given the amount of time, effort and resources involved in the design, development and integration of instructor-created multimedia, the researchers in this study sought to examine how certain course design elements impacted the level of satisfaction and student perceptions of their online learning experience. They designed multimedia instructional content with pedagogical emphasis and examined the students' impressions.

## **RESEARCH DESIGN**

The researchers strategically redesigned a learning module with the goal of improving the online student learning experience. An important feature in online courses is the technology employed to deliver the instructional content. (Rhode, 2009). Hence, the researchers employed a variety of technologies to develop a multimedia-intensive module designed to improve the student learning experience by capitalizing on new technologies, enlivening the instructional material, captivating the students, increasing their level of satisfaction, and motivating them to learn in two different course social science courses.

The participants in the study consisted of students enrolled in two pure online courses at a state University. One course was a 1000 level Introduction to Sociology class. The Introduction to Sociology course is a general education course taken by students in any major and/or by students who are still undeclared in their major and are fulfilling lower division general education requirements. A total of 50 students were enrolled in the Introduction to Sociology course. The second was an upper division 3000 level Legal Issues class. This course is primarily taken by undergraduate students pursuing a Legal Studies or Bachelor of Applied Science Degree. A total of 58 students were enrolled in the Legal Issues course.

The learning module content for the Introduction to Sociology course included culture and diversity in society. The content in the Legal Issues course was torts, a wrongful act or an infringement of a right, other than under contract, leading to civil legal liability. The original online courses consisted of 22-minutes of text-only narrated PowerPoint lecture content. The redesigned learning modules incorporated the design elements outlined in the following discussion.

### Contextualization

Rathburn (2015) defined contextualization as the process of "connecting academic skills (usually reading, writing and mathematics) to specific content that is meaningful and useful to students." (p.2). The researchers chose to incorporate contextualization as a design principle for the redesigned modules because building connections between the course content and one or more aspect of the students'

lives is an effective methodology to improve student learning (Rathburn, 2015). For example, students may not be motivated to learn writing skills in an English class if they fail to appreciate its relevance to their future endeavors (Cavazos, Johnson, & Sparrow, 2010).

For the target learning module in the first course, the instructor recorded a 59-second video introduction of the subject matter, torts, to place the instructional material in context and make it relatable for the students. The students were advised that the material was important for business professionals and managers because often times businesses are sued for negligence. So you need to know what the elements of a tort are, so you can guard against it. This statement was designed to motivate and incentivize student learning by making the material personally relevant for the students and highlighting the personal benefit of learning this information to their career endeavors.

In the second course, students were advised of the importance of social and cultural relationships in helping to successfully navigate through society and especially in the workplace. Statements designed to incentivize student learning included a short description of cultural diversity, a discussion of the importance of understanding cultural or ethnic groups within society, especially within the United States, which is comprised of a great variety of cultures from around the world, and a highlight of the fact that the understanding of cultural diversity is such an important factor in our society that some companies hire a cultural diversity specialist, trainer or liaison to help improve workplace relations.

The researchers sought to personalize the video introduction as studies have indicated that the use of a conversational tone and/or a personalized learning agent enhances learning and students are more likely to listen (Mandernach, 2009). The researchers filmed a close-up of the instructors, in their offices, as research indicates that the office setting gives the student a sense that he or she is in a one-on-one session with the instructor during office hours (Vazquez & Chiang, 2016). The instructor's tones were enthusiastic and energetic to facilitate student engagement as research shows that instructors who convey more energy and enthusiasm maintain the attention of the audience (Vazquez & Chiang, 2016). Monotone or slower speaker instructors that convey little energy and enthusiasm, have the opposite impact. In addition, the instructor's tone was conversational to trigger and sustain student attention as research reveals the natural response to this tone is to listen and respond meaningfully (Mayer, 1997).

### Segmentation

Segmentation is a design principle in which the learning materials are divided into successive segments, such as topics, rather than a continuous presentation of instructional content (Clark, Nguyen & Sweller, 2006). Ibrahim (2012) described segmentation within the context of multi-media as segmenting

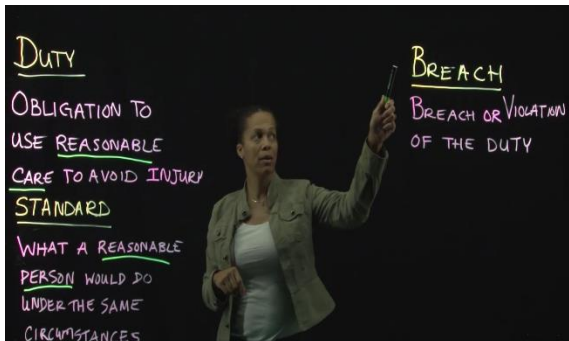
“chunks of dynamic visualizations that have an identifiable start and end point and which are distinguished by inserting pauses between different segments” (p. 87). The researchers chose to incorporate segmentation as a design principle for the redesigned modules because research indicates that student engagement in the online learning environment was greater with shorter videos, 6 minutes or less, and it was maximized with videos of less than 3 minutes (Guo, Kim, & Rubin, 2014). After 6 minutes, student engagement declines significantly. Guo, Kim, & Rubin’s research (2014) was gathered in the largest study of its kind, which analyzed data from 6.9 million video sessions in MOOCs (Massive Open Online Courses) and measured student engagement. Student engagement was measured by how long students watched each video and whether they attempted to answer post-video assessment questions.

The researchers re-developed the online module by segmenting the lecture content with the goal of maximizing student engagement in instructional multimedia content. The 22-minutes of lecture content on torts, was divided into a series of lectures, which covered the elements: introduction, duty, breach, causation, damage and defenses. Subsequently, the lecture content in the introduction to sociology course on *what is culture* was divided into a series of lectures which covered the elements: material and non-material culture, cultural diversity, encountering other cultures, and cultural diffusion. The segmentation approach has an additional benefit for the students and the instructor. Categorization by sub-topic allows the student to easily locate and review subject matter to prepare for the assessment. Also, it allows the instructor to easily replace or update online lecture content (e.g. a video related to a current event).

#### Light Board Lecture

A light board is a glass board filled with light that is placed between the video camera and the instructor. The instructor writes on it with florescent markers, similar to writing on a chalkboard or white board. The writing is reversed in the post-production phase so that the instructor faces the viewers and writes on the screen simultaneously, as shown in figure 1. Consequently, the students’ computer screens take on the appearance of a chalkboard (Friedland, Knipping, Schulte & Tapia, 2004). The benefit of this type of modality is that the instructor can engage with the content and the viewer concurrently, unlike the typical chalk board or white board lecture where the instructor’s back faces the audience while he or she writes on the board. The light board was selected for the redesigned module because it preserves the pedagogical advantages and ease of use of the traditional white board lecture, while adapting it to reach the distance learner (Friedland, Knipping, Schulte & Tapia, 2004).

Figure 1: Light board lecture.



## RESEARCH QUESTION & METHODOLOGY

The researchers queried whether the redevelopment of an online module to incorporate contextualization, segmentation and a light board lecture would increase student satisfaction and improve the student learning experience. The researchers obtained IRB approval for the study and invited students to participate in an online anonymous survey. A total of 50 students were enrolled in the Introduction to Sociology course and 25 of these students elected to participate in the study. A total of 58 college students were enrolled in the Legal Issues course and 38 students elected to participate in the study. The researchers collected both quantitative and qualitative data. The web-based survey featured first-person questions and a five-point Likert scale for responses (Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree). Also, several open-ended *why or why not* questions were asked to allow the participants to provide narrative feedback. The survey was conducted online in the learning management system and due at the same time as the weekly module. The researchers compiled the results for empirical analysis.

## FINDINGS

To measure the student impressions on contextualization, the students were asked whether the information included in the torts introduction video was beneficial to my future professional endeavors. A total of 60.53% of students responded that they strongly agreed and 39.47% responded that they agreed. This indicates that 100% of the students polled (N=38) felt the torts video was indeed beneficial to their future endeavors.

In the introduction to sociology class, students were asked whether the information included in the cultural diversity introduction video was beneficial to my future professional endeavors. A total of 68% of students responded that they

strongly agreed and 24% responded that they agreed. There were 4% of the students who responded they were undecided and 4% who disagreed. Overall, 92% of the students polled (N=25), the majority of students in the target group, felt the cultural diversity video was indeed beneficial to their future endeavors.

With respect to segmentation, in the Legal Issues course, students were asked whether they preferred that the lectures be segmented into multiple mini-lectures categorized by sub-topics (duty, breach, causation, damages) versus having one entire lecture over all the topics combined. Fifty percent of those polled (N=38) responded that they strongly agreed with this concept and 36.84% responded that they agreed. Out of 38 total respondents, this represents a majority of the target group (86.84%) agreed with the concept of mini-lectures by sub-topics over that of presenting all the material in one continuous lecture. Those who were undecided on this concept represented 5.26% and the percentage of those who disagreed was 7.89%.

In the Introduction to Sociology course, with respect to segmentation, students were also asked whether they preferred that the lectures be segmented into multiple mini-lectures categorized by sub-topics (material vs. non-material culture, cultural diversity, encountering other cultures, cultural diffusion) versus having one entire lecture over all the topics combined. Fifty six percent of those polled (N=25) responded that they strongly agreed with this concept and 32% responded that they agreed. Out of 25 total respondents, this represents a majority of the target group (88%) agreed with the concept of mini-lectures by sub-topics over that of presenting all the material in one continuous lecture. Those who were undecided on this concept represented 12% and none of the students polled in the study disagreed with this concept.

Student preferences for the light board versus the conventional narrated PowerPoint lecture were measured using a quantitative and qualitative instrument. Students in the Legal Issues course were asked about their preference for the light board lecture and whether they preferred the light board method of educational instruction over the traditional narrated PowerPoint lectures. While only 10.53% disagreed with the preference of the light board lecture (N=38), 39.47% strongly agreed and 26.32% agreed with the preference of the light board lecture over the traditional narrated PowerPoint lecture. This represents a majority of the students (65.79%) indicating a preference of the light board method of instructions in online classes over the traditional narrated PowerPoint lectures. Results also indicated that 23.68% were undecided on this variable.

Students in the Introduction to Sociology course were also asked about their preference for the light board lecture and whether they preferred the light board method of educational instruction over the traditional narrated PowerPoint lectures. While only 8% disagreed with the preference of the light board lecture (N=25), 36% strongly agreed and 20% agreed with the preference of the light board lecture

over the traditional narrated PowerPoint lecture. This represents a slight majority of the students (56%) indicating a preference of the light board method of instructions in online classes over the traditional narrated PowerPoint lectures. Results also indicated that 36% were undecided on this variable.

In addition, students were also asked to *please indicate why or why not* in order to provide detailed feedback explaining their preference with regard to the Light Board lecture. Most of the comments were in favor of the light board. Students described it as engaging, more personable, appealing to visual learners, easier to follow and retain the information, and more similar to a conventional live lecture. The students that did not prefer the light board lecture found that that PowerPoint lecture was easier to follow or navigate.

Chart 1, (Appendix A) includes all of the narrative feedback received when asked the question on their preference for or against light board lectures. As the chart indicates, the majority of the comments received were positive, with only a few comments that indicated a lack of preference or a neutral response for the light board lecture.

Finally, students were asked to provide any other comments about their impressions on the redesigned module. The feedback recorded was overwhelmingly positive. In summary, the students found the design features in the module increased their level of satisfaction and enhanced their online learning experience. Below are just a few examples of the student impressions which expressed a high level of satisfaction and an enhanced online learning experience:

- “I absolutely love your methods and how you break things down for us to understand. I don’t get that with my other teachers I pretty much have to teach myself so please understand that you are highly appreciated”
- “My opinion is this style of teaching is very engaging for online students. I hope you continue.”
- “I actually don’t avoid your assignments because I easily work through them and listen to lectures 10 mins or less and actually feel like I understand.”
- “I think you have done an outstanding job with how the information is taught. I also like how you set up the test where it is not overwhelming but it allows the tester to recall the information and apply it to answer the questions.”
- “I appreciate all the effort put forth into the breakdown of the segments within the modules, the varied lecture approaches/formats and the self-assessments. I really wish other professors of online courses would do the same!”

## CONCLUSION, LIMITATIONS & RECOMMENDATIONS



This study provides empirical evidence of the students' impression of elements designed to improve their online learning experience. With respect to contextualization, 100% of the students polled (N=38) felt the 59-second torts introduction video was indeed beneficial to their future endeavors. In the cultural diversity introduction video, 92% of the students polled (N=25) felt this video was indeed beneficial to their future endeavors. This would indicate that the material presented would likely motivate the students to make the investment of time and effort to learn the material. The researchers concluded that inclusion of short introductory videos at the beginning of each learning module would increase student satisfaction and enhance the student learning experience.

The concept of contextualization lends itself to the course content in Legal Studies because the law and society are inextricable and hence natural connections can be easily drawn between the content and the learner. The same can be said of Introduction to Sociology courses with respect to contextualization because the study of human social relationships and institutions are topics that are relatable to students in their everyday life. Hence, the instructor can easily create short videos introducing the topic and showing personal relevancy. This was indeed accomplished in the cultural diversity learning module referenced earlier in the manuscript.

For some courses, however, application of this design principle may vary based upon the topic. As such, it may be more difficult to incorporate the concept of conceptualization in certain other courses. For example, it may not be as easy to communicate contextualization and personal relevancy in a chemistry course for non-science majors.

Relatively little time, expenses and resources are involved the development of these contextualized materials. The ratio of production time versus duration of the produced content is close to one to one because the instructor can self-record the introduction with a laptop computer, equipped with a camera and microphone and little preparation is involved. Hence, the cost-benefit analysis yields a recommendation in favor of developing these types of materials course-wide.

With respect to segmentation, in the Legal Issues course, a vast majority of the students (86.84%) agreed with the concept of mini-lectures by sub-topics over that of presenting all the material in one continuous lecture. A minority of the students were either undecided (5.26%) or disagreed (7.89%). In the Introduction to Sociology course, a vast majority of the students also (88%) agreed with the concept of mini-lectures by sub-topics over that of presenting all the material in one continuous lecture while a minority of the students were undecided (12%) and none of the students were in disagreement (0%). Hence, the segmentation of the multimedia content is a preferable method of delivering the instructional content. Segmentation can be universally applied to other types of courses including non-Legal Studies and non-Sociology courses because it simply involves delivering

content in subdivided sections instead of a single continuous lecture. Similar to the contextualized materials, the development of these materials is cost-effective. It involves the same amount of time as developing the instructional materials in a continuous, non-segmented fashion. It can be created with free screen capturing resources, narrative PowerPoint software, or a laptop computer. Segmentation of the course materials is highly recommended for online courses because it is highly beneficial to the students, it involves little or no cost or additional time, and it allows the instructor to easily replace and update online instructional content.

Lastly, with respect to the light board lecture, in the Legal Issues course, the majority of the students (65.79%) preferred the light board over the narrated PowerPoint lecture and a minority of the students were either undecided (23.68%) or disagreed (10.53%). In the Introduction to Sociology course, a slight majority of the students (56%) also preferred the light board over the narrated PowerPoint lecture and a minority of the students were either undecided (36%) or disagreed (8%). Hence, the inclusion of the light board lectures is likely to have a positive impact on the level of student satisfaction and on the student learning experience, irrespective of the course content. However, this feature is not low cost. At the time of this article, the cost was approximately \$10,000. This technique requires installation and a trained videographer to record and produce the instructional content. The end-product is beneficial to the students, but the feasibility of incorporating it is based upon budgetary constraints. It is less likely to be a technique that can be adopted on an individual course basis, but more likely to be feasible if the resources were purchased to be used Department, College or University-wide to spread the cost and benefit across the curriculum.

The researchers could recommend that additional longitudinal studies covering multiple courses over a greater time-period may provide more insight as well. A further limitation of the study which, if investigated, could provide additional significant insight would be to investigate more closely the effect of multimedia content as a method of instruction on actual student performance. Although not the scope and focus of the present study, additional studies could be conducted to measure the difference in actual student learning outcomes by comparing scores of traditional lecture content in assessments versus scores received from multimedia content presented as the method of instruction. Pre and post-tests could be created to facilitate the investigation on actual student performance and provide additional insight into the benefits of using multimedia content as a preferred method of instruction.

Due to the nature of the present study, student performance could not be isolated for incorporation into the present factors under consideration and analyzed in this study. However, it is entirely possible that if other course revisions were made to the module, these could have positively impacted student performance in some way.

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